UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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FINAL VERSION
NAVAJO-BROWN VANDERVER
AND
NAVAJO-DESIDERIO URANIUM MINING AREAS
NAVAJO NATIONS
BLUEWATER, NEW MEXICO
PRELIMINARY ASSESSMENT WORKPLAN

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United States Environmental Protection Agency
Emergency Response Section
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I. INTRODUCTION

On October 3, 1990, the Emergency Response Section (ERS) was notified by the Agency for Toxic Substances and Disease Registry (ATSDR) of the potential health hazards associated with the uranium mining tailing located at the Navajo-Brown Vanderver (N-BV) and Navajo-Desiderio (N-D0) Uranium Mining Areas. At this time, the ATSDR is drafting a Public Health Advisory for these areas based on the potential adverse environmental and health hazards associated with these mining sites.

II. BACKGROUND

The N-BV and N-D sites are located in Bluewater, New Mexico. The sites are located on land administered by the Navajo Nation and lie within the Ambrosia Lake subdistrict of the Grants Uranium Mining District. The N-BV mine encompasses approximately 155 acres, and the N-D mine covers about 130 acres. The Sites lie within a sparsely populated agricultural area. The Navajo Nation estimate that approximately 500 people may be affected by the environmental hazards associated with these sites.

The N-BV mine was operated periodically from 1952-1966 and was operated by several mining firms including Santa Fe Uranium, Federal Uranium Mesa Mining Company, and the Cibola Mining COm-pany. The operations consisted of both surface and subsurface mining techniques. Several open shafts and large pits are visible at the site and access is not restricted. The mined ore was hand sorted and shipped to various milling operations located in Shiprock, New Mexico, or the Durango, Colorado, area. It is estimated by the Navajo Nation that approximately 25,000 tons were removed from the mine. The ore was processed into ap-proximately 49 tons of uranium oxide (U_3O_8) and over 37 tons of vanadium pentoxide (V_2O_5). Mined ore which failed to contain sufficient quantities of uranium were discarded at the mine sites. These tailing piles remain exposed at the sites. Several tons of tailings are believed to have been used as base material for neighboring roads and concrete.

The N-D mine was believed to be operated from 1952-1957. The exact name of the operating company or companies is not known at this time. This mine primarily employed strip mining tech-niques. The Navajo Nation estimate that over 11,110 tons of uranium ore was extracted from this operation.

III. ASSOCIATED HAZARDS

The ATSDR initiated a preliminary investigation at the sites to determine if they pose physical, chemical and/or radiological hazards. In summary, the ATSDR determined that the open pits and shafts do pose a significant physical hazard to the neighboring populations. The open shafts and pits are not fenced or secured and neighboring children may accidentally fall or get lost within these pits or shafts.

The ATSDR noted that the heavy metals associated with the weathering mine tailings may pose a significant environmental and health hazard. Heavy metals such as chromium, arsenic, vanadium, and zirconium may be leaching from the tailing piles and may be adversely affecting the groundwater quality of the region. In addition, neighboring populations may be exposed to wind blown heavy metal particulates.

Finally, the tailing piles contain elevated concentrations of radioactive material associated with the decay and degradation of uranium. Radioactive particulates and radon gas are likely to be migrating from the tailings. ATSDR believes that the neighboring population may be exposed to unsafe levels of radiation.

IV. ATSDR RECOMMENDATIONS

ATSDR has recommended action to assess and assist the local residents. ATSDR has recommended that an educational program be implemented to inform the neighboring population of the potential health effects of the mines. In addition, ATSDR has recommended that a more complete and detailed assessment be performed to assess the health impacts associated with the tailings.

ATSDR recommended that additional data be collected to characterize the amount and extent of contamination associated with the tailings. This would include collecting and analyzing soil, air and surface and groundwater samples for heavy metals and radioactivity. To investigate the radiation exposure of the neighboring population, ATSDR recommended the implementation of a personal radiation dosimeter program. Personal radiation dosimeters would allow ATSDR to estimate the external radiation exposure levels of the community. In addition, a complete biota, food crop and livestock study should be undertaken to evaluate the internal radiation exposure levels of the neighboring communities.

To implement ATSDR's recommendations, several Federal agencies such as the Bureau of Indian Affairs, Indian Health Services, EPA Superfund Program, EPA Office of Air and Radiation, Department of Energy, State of New Mexico and others will need to be involved with this project.

V. EMERGENCY RESPONSE ROLE

The Environmental Protection Agency Region IX, Emergency Response Section (ERS) has been tasked to perform the geochemical and georadiological study of the sites to assess the environmental and physical hazards of the area. ERS, accompanied by its Technical Assistant Team contractor, Ecology and Environment, are prepared to collect and analyze tailing, soil, air, surface water, run-off sediment and groundwater samples. EPA's Office of Air and Radiation, Las Vegas, Nevada, will be supporting ERS with their expertise in conducting radiation surveys and overseeing personal radiation safety.

An initial gamma radiation survey will be conducted by Colleen Petullo, OAR, to determine the external radiation hazards associated with the site. An "Exclusion" zone will be delineated by Collen Petullo, OAR health physicist, to restrict non 40 hr trained personnel and unauthorized people from access to the study areas. In addition, areas with gamma radiation levels exceeding 2.5 millirem/hr will be classified as "Hot" zones and personnel will not be allowed to work in these zones without direct supervision and approval of the health physicist. All personnel will be monitored exiting the study area. Instruments and protective gear will be monitored for radiation. Every effort will be made to avoid the generation of radioactive waste. A formal decontamination protocol will be implemented.

Physical hazards such as open shafts and pits will be delineated and flagged. An inventory to estimate the volume of potentially contaminated material will be collected.

Both surface and boring samples will be collected within the tailing piles and surrounding areas. Storm channel deposits will be collected to determine if rain run-off is acting as a mode of contamination transport. In addition, neighboring water well samples and, if possible, surface water samples will be collected and analyzed. All samples will be analyzed for heavy metals, radioactive isotopes and radioactivity. The samples will be collected pursuant to an approved sampling and work plan being drafted by Ecology and Environment. An extensive photographic record will be made during the assessment.

Areas of elevated gamma radiation will be delineated and used as potential monitoring stations for calculating radon flux measurements. These measurements will determine the amount of radon being emitted into the atmosphere from the tailings. If warranted a complete radon gas monitoring program above and down-wind of the tailing piles will be developed and implemented. Several carbon absorption test kits will be employed to capture the radioactive gas. Testing will be pursuant to the radon flux method outlined in 40 CFR Part 61. A domestic radon monitoring program and a biota/livestock sampling program has been recommended by ATSDR and ERS will try to coordinate these activities

will other Federal and Navajo agencies.

The assessment will be directed by the ERS On-Scene-Coordinator (OSC). The OSC will be consulting and working closely with the various other Federal and Tribal agencies participating in this investigation. The assessment is scheduled to begin on November 13, 1990. A meeting between ERS personnel and the Navajo Superfund program is scheduled on November 13, 1990 at 4:00 pm. The OSCs assigned to lead the assessment are Robert Bornstein (415-744-2298) and Robert Mandel (415-744-2290). The project Health Physist from OAR will be Colleen Petullo (702-798-2446). The TAT Project Leaders are Mary Sue Philips and Beverly Pester (415-777-2811).

Analytical samples will be sent to TMA/Eberline laboratory located in Albuquerque. Sample analysis will be determined by using a flow chart developed by OAR.

The results of the sampling program will be compared to both Federal and State Action levels governing radioactivity and heavy metals. The following radioactive standards will be employed:

- o Drinking Water: 40 CFR 141
  - MCL for radium-226 and radium 228: 5 pCi/l
  - MCL for gross alpha particule activity (including radium-226 but excluding radon and uranium): 15 pCi/l
  - MCL for gross beta: 50 pCi/l
  - MPC (10 CFR 20) 9E-4 uCi/ml (U^{234})
    8E-4 uCi/ml (U^{235})
    1E-3 uCi/ml (U^{238})
- o Soil: 40 CFR 192
  - Radium-226 in top 15 cm: not > 5 pCi/g over background
  - Radium-226 below 15 cm: not > 15 pCi/g over background
- o Ambient Air: 40 CFR 192
  - Radon-222: Average over 1 year over disposal areas not to exceed 20 pCi/m^2/sec (Radon Flux)
    Annual average at residential areas not to exceed 0.5 pCi/m^2/sec (Radon Flux)
  - Radon-222 in occupied buildings: not to exceed .03 WL over background

  MPC (10 CFR 20): 1E-10 uCi/ml (U^{234})
  1E-10 uCi/ml (U^{235})
  7E-11 uCi/ml (U^{238})
- o Gamma radiation survey standard: >= 100 millirem/year*

* Proposed Standard by the Presidential Working Group on Radiation Safety (DOE,HHS,ATSDR)

MCL = Maximum Contaminant Level
MPC = Maximum Permissible Concentration

Based on the results of the assessment, ERS will make a

determination if the sites warrant a Removal Action pursuant to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 CFR Part 300). This response may include but is not limited to the following activities:

- o The physical removal or encapsulation of the tailing piles;
- o The proper closure of the mine pits and shafts;
- o The relocation of exposed population;
- o The supply of alternate water to the community;
- o The erecting of warning signs and a fence to restrict assess to the sites;
- o The application of a soil sealant to restrict the migration of contaminants from the sites.

If the NCP criteria for Removal Actions are met, an Action Memorandum will be forwarded to EPA Headquarters, Emergency Response Division to request funding approval. Headquarters approval is required because Removal Actions on Reservations have been determined to have "national" significance.

PROJECT CONTACTS

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